



1. LENGTH OF NEED (X) AND OFFSETS "Y" & "Z" SHALL BE COMPUTED IN ACCORDANCE WITH THE EQUATION ON SHEETS 2 OF 10. (X) DIMENSIONS TO BE USED SHALL BE A MULTIPLE OF 6'-3". TO FIND THE REQUIRED LENGTH OF NEED (X) WHEN OFFSET "Y" HAS TO BE SET, USE THE EQUATION $X = (LH - "Y") LR/LH$.
2. MINIMUM LENGTH OF GUARD RAIL IN ANY CASE SHALL BE 75'-0" (LENGTH OF NEED $X = 62'-6"$), FOR END TREATMENT SYSTEMS LESS THAN 50'-0", THE REMAINING LENGTH TO MEET THE 75'-0" MIN. WILL BE BASED ON USING ADDITIONAL W-BEAM BLOCKED OUT GUARD RAIL 704-03-00100 PLACED BETWEEN THE TRANSITION AND END TREATMENT. THE COST OF ADDITIONAL W-BEAM GUARD RAIL SHALL BE PAID FOR UNDER THE END TREATMENT PAY ITEM.
3. SEE TYPICAL INSTALLATION ELSEWHERE IN THESE PLANS.
4. EMBANKMENT WIDENING TO PROVIDE SLOPES NOT STEEPER THAN 10:1 IS REQUIRED TO MAINTAIN PROPER RAIL TO VEHICLES POSITION. WIDENING MAY BE ACCOMPLISHED AS DETERMINED BY THE DESIGNER OR THE PROJECT ENGINEER.
5. SEE OPPOSING TRAFFIC GUARD RAIL REQUIREMENTS ON SHEET 2 OF 10 FOR METHOD OF CALCULATING LENGTH OF NEED (X) AND OFFSET (Y) OF RAIL LEFT SIDE WHEN TRAFFIC IS TWO WAY.
6. PAY ITEMS FOR ALL GUARD RAIL COMPONENTS ARE TO BE IN ACCORDANCE WITH LAYOUT DETAILS AND/OR QUANTITY TABLES FURNISHED WITH PROJECT PLANS. GUARD RAIL PAY ITEMS SHALL INCLUDE ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLETE THE GUARD RAIL INSTALLATION AS SHOWN ON THE PLANS.
7. LONGITUDINAL DIMENSIONS FOR GUARD RAIL ARE MEASURED ALONG THE FACE OF RAILING
8. THE QUANTITY FOR THE EMBANKMENT WIDENING AT BRIDGE ENDS IS INCLUDED IN THE EMBANKMENT QUANTITY OF THE ROADWAY.
9. FOR BRIDGES WITH GUARD RAILS IN URBAN AREAS WITH DESIGN SPEED OF 45 mph OR LESS, SEE DOTD EDSM NO. II. 3.1.4 FOR DESIGN INFORMATION.
10. FOR GUARD RAIL INFORMATION FOR EXISTING HIGHWAYS, SEE DOTD EDSM No. II. 3.1.3 FOR DESIGN INFORMATION.
11. A TANGENT END TREATMENT (704-11-00200) MAY BE USED AS AN ALTERNATE TO THE FLARED END TREATMENT. A ZERO END TREATMENT OFFSET AND A ZERO FLARE RATE ($A/B = 0$) IS REQUIRED WHEN THE TANGENT END TREATMENT IS USED AND THE LENGTH OF NEED "X" SHALL BE CALCULATED BASED ON A "ZERO" FLARE RATE.
12. THE POINT WITHIN THE GUARD RAIL END TREATMENT WHERE LENGTH OF NEED TERMINATES MAY VARY WITH EACH TYPE OF GUARD RAIL END TREATMENT. THE 12'-6" LENGTH APPLIES TO MOST END TREATMENTS. HOWEVER, REGARDLESS OF THE TYPE OF END TREATMENT USED, THIS POINT SHALL BE LOCATED AT THE SAME STATION ON THE ROADWAY.
13. THE RETROREFLECTIVE ADHESIVE SHEETING (12" X 2'-8") (TYPE III HIGH INTENSITY OBJECT MARKER PATTERN) SHALL BE APPLIED TO NOSE AFTER CURVING. SEE SECTION 1015 OF THE LATEST L.A. STD. SPECS. FOR ROADS AND BRIDGES FOR SPECIFICATIONS AND THE SHEETING MANUFACTURERS RECOMMENDATIONS FOR INSTALLATION. FOR PATTERN DETAIL, SEE OBJECT MARKER DETAILS.
14. UNLESS OTHERWISE NOTED, ALL GUARD RAIL COMPONENTS SHALL CONFORM TO THE REQUIREMENTS OF THE AASHTO-AGC-ARTBA JOINT COOPERATIVE COMMITTEE, "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE", CURRENT EDITION.
15. 704-01-01000 IS USED IN LIEU OF 704-08-00200 FOR BRIDGES WITH FLEXIBLE BRIDGE RAILING (REINFORCED CONCRETE BRIDGE RAILING IS CONSIDERED TO BE RIGID.)
16. GUARD RAIL INSTALLATIONS MAY BE PAVED BY USING INCIDENTAL CONCRETE PAVING (4" THICK) (706-03-00100) OR 4" MIN. ASPHALTIC CONCRETE. THE INCIDENTAL CONCRETE OR ASPHALT WILL BE USED IF A LAYOUT DETAIL, PAY ITEM AND QUANTITY IS INDICATED IN THE PLANS. SEE SHEET 10 FOR REQUIRED POST DETAILS WHEN PAVING IS USED AROUND POSTS.

704-01-01000	GUARD RAIL (SINGLE THRIE BEAM) (3'-1/2" POST SPA.)
704-01-01020	GUARD RAIL (SINGLE THRIE BEAM) (6'-3" POST SPA.)
704-01-02000	GUARD RAIL (DOUBLE THRIE BEAM) (3'-1/2" POST SPA.)
704-01-02020	GUARD RAIL (DOUBLE THRIE BEAM) (6'-3" POST SPA.)
704-03-00100	BLOCKED OUT GUARD RAIL
704-05-00100	GUARD RAIL ANCHOR SECTIONS (BCT)
704-06-00100	GUARD RAIL ANCHOR SECTIONS (TRAILING END)
704-06-00200	GUARD RAIL ANCHOR SECTIONS (TRAILING END) (SINGLE THRIE BEAM)
704-07-00200	GUARD RAIL BRIDGE ATTACHMENTS (SINGLE THRIE BEAM)
704-08-00200	GUARD RAIL TRANSITIONS (DOUBLE THRIE BEAM)
704-11-00100	GUARD RAIL END TREATMENT (FLARED)
704-11-00200	GUARD RAIL END TREATMENT (TANGENT)
704-11-00300	GUARD RAIL END TREATMENT (BI-DIRECTIONAL)
NS-800-00120	PIER PROTECTION SYSTEM
NS-700-00240	SPECIAL GUARD RAIL ANCHOR SECTION

